Defusing the Bomb Threat

Andrews Air Force Base demonstration (July 2004) of the IEDS. In the foreground, a truck containing ANFO is being interrogated, while the Air Force One plane taxis by in the background.

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INEEL Explosives Detection System - IEDS

In the past four years, more than 1,200 people have been killed by the wanton and willful detonation of explosives hidden in vehicles by terrorists. Around the world, explosives-laden cars and trucks have become terrorists' weapons of choice.

This type of weapon is a favored instrument of terrorists and assassins because these explosive platforms act as their own delivery mechanisms – able to carry large quantities of explosives without attracting undue suspicion.

In response, the INEEL is developing a system that will greatly reduce the threat represented by these improvised explosive devices.

In collaboration with the United States Air Force Electronics Systems Center, INEEL engineers have developed an explosive detection system.

Using a technique called Pulsed Neutron Analysis, the system uses high-energy neutron output to cause nuclear excitation of materials within the vehicle. The INEEL system uses detectors to identify elements within the subject cargo that indicate the presence of explosives. The whole process, which is designed to interrogate the vehicle for

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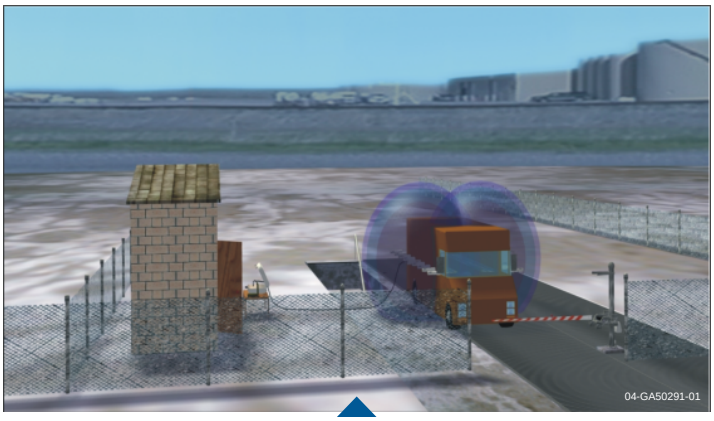

The IEDS equipment can be configured as a self-contained mobile unit for rapid deployment to remote locations or constructed into a permanent "Smart Gate" system.

Once the vehicle is stationary between the sensors (far left), the array banks move in to optimal scanning range.

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five minutes, can detect a fraction of the explosives used in Oklahoma City contained within a medium-sized vehicle.

The IEDS can be installed at access control points where entering vehicles can be quickly interrogated. The driver would park the vehicle to be inspected within the detection zone of the IEDS equipment. Once the driver exits the vehicle, the IEDS process would begin.

The patents-pending detection system was developed to assist security personnel by providing them with a tool that allows the quick and accurate determination of the presence of explosives.

Through the combination of rapid neutron interrogation techniques and the use of high probability statistical inference, the IEDS has the ability to yield precise determination of the presence of explosives, while minimizing the indication of false positives.

Summary IEDS advantages

- Ability to increase detection sensitivity based on threat levels
- Elimination of detection uncertainties
- Easily modified to integrate technological advances
- Robust design with few moving parts
- Cost-effective
- System self-monitors
- Graphical User Interface requires minimal training
- Resources of a national lab

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Key Capabilities

- Detects explosives:
  - A fraction of the size of those used in Oklahoma City
  - Concealed in any location on a vehicle
  - Within 300 seconds (five minutes)
  - such as ANFO, HMX, PETN, RDX, TNT, etc.
- Proven technology
- Operationally safe
- Non-destructive, non-intrusive, non-contact

System Components

- Neutron generators
- Large array of sodium iodide (NaI) detectors
- Laptop computer

INEEL Explosives Detection System